

26. LIFE STRATEGIES OF FRESHWATER INVERTEBRATES: COUPLING LIFE HISTORY TRAITS AND FITNESS IN A CHANGING WORLD

26-O Adaptation of benthic communities to ecopeaking in alpine rivers. Maria Cristina Bruno¹ - Bruno Maiolini²

*Edmund Mach Foundation, Research and Innovation Centre, San Michele all'Adige, Italy*¹ - *Muse - Museo delle Scienze, Invertebrate Zoology and Hydrobiology Section, Trento, Italy*²

Daily changes in physical and chemical water parameters (i.e., ecopeaking) can occur in defined seasons in natural conditions in kryal, due to the summer daily glacial melt and consequent changes in runoff. Only few and specialized taxa living in such extreme habitats are adapted to such cyclic changes (e.g., Chironomidae Diamesinae and Simuliidae Prosimulinae). In regulated rivers, however, ecopeaking changes are sudden, occur once or more times per day, and span through the entire year, and are related to the releases from hydropower plants fed by high elevation and stratified reservoirs (i.e., hydropeaking). The entire downstream benthic community is affected and, because large hydropower plants are usually at low elevation, they affect communities which are not necessarily adapted to naturally-occurring changes. Hence, the effects of ecopeaking is very relevant. Changes in discharge (hydropeaking) and temperature (thermopeaking) have been proved to cause massive drift responses in benthic invertebrates in field and simulated conditions, whereas changes in turbidity, suspended sediments, conductivity and other chemical parameters have been less investigated.

Rapid growth of the human population and economic development are tightly coupled with an increase in global energy demand, which is causing a current boom in hydropower dam construction (Zarfl et al., 2015). The effects on the biota already are, and will be, dramatic, and need to be fully understood. Simuliidae were selected as target taxon to assess the effect of ecopeaking on larval development and emergence. In fact, Simuliidae larvae are filter feeders, sensitive to alterations of solid transport and temperature and they permanently colonize floating substrates. Hence, they are easy to be semi-quantitatively collected upstream and downstream of the alteration source. Furthermore, the larvae have sclerotized head capsules which can be easily measured to assess life cycle parameters, and the pupal cases and exuviae remain fixed on the substrate after adult emergence and allow identification at the species level.

26-O Monopolisation hypothesis in freshwater ponds: is the large bank of resting stages the key feature? Diego Fontaneto

Institute of Ecosystem Study, ISE CNR, Verbania, Italy

An apparent paradox is present in the pattern of distribution of genetic diversity in microscopic freshwater invertebrates. Their high dispersal capacity is in contrast with the genetic differentiation among populations in neighbouring ponds. The 'monopolisation hypothesis', accounting for founder events, local adaptation, and banks of resting stages, is often suggested as the main explanation. Thus, locally adapted genotypes surviving in large number as resting eggs should prevent new incoming genotypes to settle in the pond. Is the presence of resting banks the key point in buffering against incomers? To support this idea I will provide empirical evidence comparing genetic structure of population of phylogenetically related co-occurring rotifers, similar in size, feeding behaviour and reproductive ability, but differing for the production of resting stages. Monogonont rotifers, producing resting eggs, should conform to the hypothesis; on the other hand, bdelloid rotifers, entering dormancy in every moment of their lives and not producing resting eggs, should not conform to it.

26-O Functional response of communities of the family Chironomidae to deteriorating ecosystems health in an effluent impacted river, Eastern Cape, South Africa. Ogehenekaro Nelson Odume¹

Rhodes University,, Grahamstown, South Africa